

## Class 7 Chapter Ratio and Proportion Test paper-1

A. Complete the following statements

1. The comparison of two quantities of the same kind by means of division is termed as \_\_\_\_\_.
2. The two quantities to be compared are called the \_\_\_\_\_ of the ratio.
3. The first term of the ratio is called the \_\_\_\_\_ and the second term is called the \_\_\_\_\_.
4. In a ratio, only two quantities of the \_\_\_\_\_ unit can be compared.
5. If the terms of the ratio have common factors, we can reduce it to its lowest terms by cancelling the \_\_\_\_\_.
6. When both the terms of a ratio are multiplied or divided by the same number (other than zero) the ratio remains \_\_\_\_\_. The obtained ratios are called \_\_\_\_\_.
7. In a ratio the order of the terms is very important, (Say True or False)
8. Ratios are mere numbers. Hence units are not needed, (Say True or False)
9. Equality of two ratios is called a \_\_\_\_\_. If  $a, b, c$  and  $d$  are in proportion, then  $a : b :: c : d$
10. In a proportion, the product of extremes = \_\_\_\_\_.

[Hint:

- (1) Ratio                      (2) terms
- (3) antecedent, consequent
- (4) same                      (5) common terms
- (6) unchanged, equivalent ratios
- (7) True                      (8) True
- (9) proportion              (10) product of means]

B. Solve these questions:

1. A ribbon is cut into 3 pieces in the ratio 3: 2: 7. If the total length of the ribbon is 24 m, find the length of each piece.

B. 1. Let the ratio =  $x$ .

$$3x + 2x + 7x = 24$$

$$12x = 24$$

$$x = 24/12$$

$$x = 2$$

Hence,  $3x = 3 \times 2 = 6$

$$2x = 2 \times 2 = 4$$

$$7x = 7 \times 2 = 14$$

Ans

2. The ratio of boys to girls in a class is 4 : 5. if the number of boys is 20, find the number of girls.

2. Let no of girls =  $x$

$$4:5 :: x:20$$

P of mean = P of extreme

$$5 \times x = 4 \times 20$$

$$x = \frac{4 \times 20}{5}$$

$$x = 16$$

Hence, no of girls = 16. Ans

3. (a) If  $A : B = 4 : 6$ ,  $B : C = 18 : 15$  Find the ratio of  $A : B : C$
- (b) If  $A : B = 5 : 8$  and  $B : C = 16 : 25$  find  $A : C$

3. (a)  $\frac{A}{B} = \frac{4 \times 3}{6 \times 3} = \frac{12}{18}$  and  $\frac{B}{C} = \frac{18 \times 1}{15 \times 1} = \frac{18}{15}$

Hence  $A : B : C = 12 : 18 : 15$  Ans

(b)  $\frac{A}{B} = \frac{5 \times 2}{8 \times 2} = \frac{10}{16}$  and  $\frac{B}{C} = \frac{16 \times 1}{25 \times 1} = \frac{16}{25}$

Hence  $A : C = 10 : 25$  Ans

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4. A bronze statue is made of copper, tin and lead metals. It has  $\frac{1}{10}$  of tin,  $\frac{1}{4}$  of lead and the rest copper. Find the part of copper in the bronze statue.

4. Let tin =  $\frac{1}{10}$  and Lead =  $\frac{1}{4}$  =  $\frac{5}{20}$

Copper =  $1 - \left(\frac{1}{10} + \frac{1}{4}\right)$

Copper =  $1 - \left(\frac{2+5}{20}\right)$

Copper =  $1 - \frac{7}{20}$

Copper =  $\frac{20-7}{20}$

Copper =  $\frac{13}{20}$  part. Ans.

5. (a) Divide 880 between A, B and in ratio  $\frac{1}{5} : \frac{1}{6}$   
 (b) Find A : B if 15% of A = 20% of B

5. Let the ratio =  $x$

$\frac{1x}{5} + \frac{1x}{6} = 880$

$\frac{6x + 5x}{30} = 880$

$\frac{11x}{30} = 880$

$x = \frac{880 \times 30}{11}$

$x = 2400$

Then  $\frac{1x}{5} = \frac{1 \times 2400}{5} = 480$  Ans.

$\frac{1x}{6} = \frac{1 \times 2400}{6} = 400$  Ans.

(b) 15% of A = 20% of B

$\frac{15}{100} \times A = \frac{20}{100} \times B$

$\frac{A}{B} = \frac{20}{100} \times \frac{100}{15}$

$\frac{A}{B} = \frac{4}{3} = 4:3$  Ans.

6. What number must be added to each 9 : 16 to make 2 : 3 ?

6. Let the no. =  $x$

$\frac{9+x}{16+x} = \frac{2}{3}$  (by c.m.)

$3(9+x) = 2(16+x)$

$27+3x = 32+2x$

$3x-2x = 32-27$

$x = 5$  Ans.

7. What number must be subtracted to each 17 : 33 to make 7 : 15 ?

7. Let the no. =  $x$

$\frac{17-x}{33-x} = \frac{7}{15}$  (by c.m.)

$15(17-x) = 7(33-x)$

$255 - 15x = 231 - 7x$

$255 - 231 = -7x + 15x$

$24 = 8x$

$\frac{24}{8} = x$

$3 = x$  Ans.

8. Two numbers are in ratio 5 : 6. If 8 is subtracted from each ratio became 4 : 5. Find the number?

8. Let the ratio =  $x$

$\frac{5x-8}{6x-8} = \frac{4}{5}$  (by c.m.)

$5(5x-8) = 4(6x-8)$

$25x-40 = 24x-32$

$25x-24x = -32+40$

$x = 8$  Ans.

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9. (a) If  $X:Y = 3:2$  find  $(2x+3y):(3x+5y)$

$$\begin{aligned} \frac{2x+3y}{3x+5y} &= \frac{6}{9+10} \\ &= \frac{2 \times \frac{3}{2} + 3}{3 \times \frac{2}{2} + 5} \\ &= \frac{2 \times \frac{3}{2} + 3}{3 \times \frac{2}{2} + 5} \\ &= \frac{6}{19} \end{aligned}$$

Ans.  $12:19$

(b) if  $(3a+5b):(3a-5b) = 5:1$  find  $a:b$  ?

$$\begin{aligned} \frac{3a+5b}{3a-5b} &= \frac{5}{1} \quad (\text{by C.M}) \\ 3a+5b &= 15a-25b \\ 3a-15a &= -25b-5b \\ -12a &= -30b \\ \frac{a}{b} &= \frac{30}{12} = \frac{5}{2} \end{aligned}$$

Ans.  $a:b = 5:2$

10. (a) if  $\frac{A}{3} = \frac{B}{4} = \frac{C}{5}$  then find  $A:B:C$

$$\begin{aligned} \frac{A}{3} &= \frac{B}{4} & \frac{B}{4} &= \frac{C}{5} \\ \frac{A}{B} &= \frac{3}{4} & \frac{B}{C} &= \frac{4}{5} \end{aligned}$$

Hence,  $A:B:C = 3:4:5$  Ans.

(b)  $\frac{1}{x} : \frac{1}{y} : \frac{1}{z} = 2:3:5$  find  $x:y:z$

$$\begin{aligned} \frac{1}{x} &= \frac{2}{20}, \quad \frac{1}{y} = \frac{3}{20}, \quad \frac{1}{z} = \frac{5}{20} \\ \text{L.C.M of } 2, 3 \text{ and } 5 &= 30 \\ x &= \frac{1}{2} \times 30 = 15, \quad y = \frac{1}{3} \times 30 = 10, \quad z = \frac{1}{5} \times 30 = 6 \end{aligned}$$

Ans.  $x:y:z = 15:10:6$

11. Find (a) Third proportional to 8 and 12

$$\begin{aligned} 8:12::12:x \\ 8 \times 12 &= 8x \\ 144 &= 8x \\ \frac{144}{8} &= x \\ x &= 18 \end{aligned}$$

Ans.  $18$

(b) The mean proportional to (i) 0.4 and 0.9 (ii) 3 and 27

$$\begin{aligned} 0.4:x::x:0.9 \\ x \times x &= 0.4 \times 0.9 \\ x^2 &= 0.36 \\ x &= \sqrt{0.36} \\ x &= 0.6 \end{aligned}$$

Hence, the mean proportion = 0.6 Ans.

$$\begin{aligned} 3:x::x:27 \\ x \times x &= 3 \times 27 \\ x^2 &= 81 \\ x &= \sqrt{81} \\ x &= 9 \end{aligned}$$

Ans.  $9$

12. Two numbers are in ratio 3:4, If LCM is 180 find the numbers?

$$\begin{aligned} 3x \times 4x &= 180 \\ 12x &= 180 \\ x &= 180/12 \\ x &= 15 \\ \text{Hence, } 3x &= 3 \times 15 = 45 \\ 4x &= 4 \times 15 = 60 \end{aligned}$$

Ans.  $45, 60$

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13. A bag contains Rs. 75 in a rupee, 50p and 25p coins in 5:8:4. Find the numbers of each coin.

13. Rs 75 in a rupee, 50p and 25p coins in 5:8:4.

50 p = 50.50  
25 p = 25.25

Let, the ratio =  $5n, 8n, 4n$

$$5n \times 1 + 8n \times 0.50 + 4n \times 0.25 = 75$$

$$5n + 4n + 1n = 75$$

$$10n = 75$$

$$n = 75/10$$

$$n = 7.5$$

$5n = 5 \times 7.5 = 37.5$   
 $8n = 8 \times 7.5 = 60.0$   
 $4n = 4 \times 7.5 = 30.0$

14.(a) Find  $x$  if 36, 54,  $x$  are in continued proportion.

14.  $36 : 54 :: 54 : x$

P of mean = P of extreme

$$54 \times 54 = 36 \times x$$

$$54 \times 54 = 27^2 = x$$

$$36 \times 2 = x$$

$$81 = x$$

Ans

(b) Find fourth proportional to 2.8, 1.4, 3.5

(b) Fourth proportion =  $x$

$$2.8 : 1.4 :: 3.5 : x$$

P of mean = P of extreme

$$1.4 \times 3.5 = 2.8 \times x$$

$$1.4 \times \frac{3.5}{2.8} = x$$

$$\frac{4.9}{2.8} = x$$

$$1.75 = x$$

Ans

15. What must be subtracted from each 10, 12, 19, 24 to get numbers which are in proportional?

15. Let, the no. =  $x$

$$10-x : 12-x :: 19-x : 24-x$$

P of mean = P of extreme

$$(12-x)(19-x) = (10-x)(24-x)$$

$$228 - 12x - 19x - x^2 = 240 - 10x - 24x - x^2$$

$$-19x + 24x - x^2 + x^2 = 240 - 228 + 12x - 10x$$

$$5x = 12 + 2x$$

$$5x - 2x = 12$$

$$3x = 12$$

$$x = 12/3$$

$$x = 4 \text{ Ans}$$

18. (a) If third proportional to 7 and  $x$  is 28 find value of  $x$

18. Third proportion = 28

$$7 : x :: x : 28$$

$$x^2 = 7 \times 28$$

$$x^2 = 196$$

$$x = \sqrt{196}$$

$$x = 14 \text{ Ans}$$

(b)  $2A = 3B = 4C$  then find A:B:C

(b)  $2A = 3B$        $3B = 4C$

$$\frac{A}{B} = \frac{3}{2}$$

$$\frac{B}{C} = \frac{4}{3}$$

$$A : B : C = 2 : 3 : 4 \text{ Ans}$$

17. At a certain time a tree 6 m high casts a shadow of length 8 m. At the same time a pole cast a shadow of length 20 m. Find the height of pole?

$$\frac{\text{Height of tree}}{\text{Height of pole}} = \frac{\text{Length of the shadow of tree}}{\text{Length of the shadow of pole}}$$

$$\frac{6}{x} = \frac{8}{20} \Rightarrow x = \frac{6 \times 20}{8} = 15m$$